

Note to Reviewers: This table presents a preliminary rating of the importance of stressors for the Sacramento splittail that were identified in previous Conservation Strategy Workgroup technical sessions. A description of the rating criteria are described in the table footnotes. Information presented in the table is preliminary and could change as new information is developed or becomes available (e.g., the DRERIP conceptual models). The importance ratings of stressors are provided at this time to specifically provide an understanding of splittail stressors at a level that will allow for application of the CSA short-listing criteria. This table was prepared by the following individuals at BDCP technical working sessions held on April 18, 2007: Diane Windham (NMFS); Scott Cantrell and Dan Kratville (DFG); Bill Harrell and [Stephani Spaar](#) (DWR); Bruce Herbold (EPA); Rick Sitts (Metropolitan); B. J. Miller; Chuck Hanson (Hanson Environmental); and Pete Rawlings and Rick Wilder (SAIC). Codes shown in parentheses refer to earlier stressor codes that are addressed within the applicable stressor.

Stressor	Importance Rating ¹	Relative Importance		Temporal Scope ⁴	Certainty ⁵
		Severity ²	Geographic Scope ³		
Very High Importance Stressors (1-5)					
1-8 Exposure to toxics (lethal)	3	3	1	2	2
1-9 Predation [not including CCF/only artificially heightened predation]	4	4	1	1	3
2-2 Reduced suitable spawning habitat (4-1, 4-3, 4-7)					
2-2a Extent of floodplain inundation	3	1	3	1	1
2-2b Altered hydrology (overbank flow)	2	2	1	2	2
Storage and instream flow releases	6	2	3	2	2
Flood control operations	4	2	2	2	1
2-5 Sublethal exposure to toxics	2	2	1	1	3
3-2 Reclamation/conversion of wetlands in estuary	2	1	2	1	1
3-7 Channelized riprap levees (shallow water area)	4	2	2	1	2
3-8 Expansion of non-native species (Egeria, Eichornia, etc.)	4	2	2	2	3

HANDOUT #5

SPLITTAIL STRESSOR IMPORTANCE

Stressor	Importance Rating ¹	Relative Importance		Temporal Scope ⁴	Certainty ⁵
		Severity ²	Geographic Scope ³		
3-15 Future introduction of non-native species	1	1	1	2	4 (low certainty of how splittail would be affected)
5-2 Reduced population abundance	4	4	1	2	2
6-1 Reduced organic/energy input (inflow from upstream and in-delta production)	4	2	2	1	3
6-3 Increased diversion of nutrients/production out of estuary	4	2	2	1	3
High Importance Stressors (6-10)					
2-3 Reduced suitable rearing habitat (4-1, 4-2, 4-3, 4-4, 4-5, 4-7)					
2-3a Extent of floodplain inundation	3	1	3	1	
2-3b Altered hydrology (overbank flow)	2	2	2	2	2
Storage and instream flow releases	6	2	3	2	2
Flood control operations	4	2	2	2	1
2-3c Extent of low velocity shallow water area	6	2	3	1	2
2-3d Extent of intertidal habitat	6	2	3	1	2
2-3e Extent of riparian habitat (3-6)	6	3	2	1	3
1-11 Harvest					
1-11a Legal Harvest	9	3	3	1	3
1-11b Illegal harvest	9	3	3	1	4
1-13 Disease	8	4	2	1	4
2-6 Competition (6-2, 6-4)					

HANDOUT #5

SPLITTAIL STRESSOR IMPORTANCE

Stressor	Importance Rating ¹	Relative Importance		Temporal Scope ⁴	Certainty ⁵
		Severity ²	Geographic Scope ³		
2-5a Increased consumption of food by non-natives	4	2	2	1	3
2-5b Food	6	3	2	1	3
2-5b Habitat	6	3	2	1	4
2-7 Water quality problems (e.g., reduced DO)	8	2	2	2	2
3-1 Reduced sediment input (change in volume, quality, geomorphic processes)	8	4	2	1	2
3-3 Land use changes (ag/urban development—non-levee)	6	3	2	1	2
3-10 Levee failure in the Delta (future under failed levee conditions)	8	4	2	2	4
5-1 Reduced genetic integrity and diversity (5-3, 5-4)	8	4	2	1	3
5-5 Increased ecosystem stability (5-7)	8	4	2	2	4
5-6 Reduced habitat diversity	6	3	2	1	3
6-5 Increased channel velocities/reduced hydrologic residence time	6	3	2	1	2
6-6 Increased water depths relative to the photic zone	6	3	2	1	4
Moderately Important Stressors (11-15)					
1-1 SWP entrainment					
1-1a Pre-louwer predation (CCF)	12	3	4	2	3
1-1b Louwer efficiency	12	3	4	2	2
1-1c Truck/handling mortality	16	4	4	2	2
1-1d Post-release mortality	10	2	5	2	2
1-B CVP entrainment					
1-Ba Louwer efficiency	12	3	4	2	2
1-Bb Truck/handling mortality	16	4	4	2	2

HANDOUT #5

SPLITTAIL STRESSOR IMPORTANCE

Stressor	Importance Rating ¹	Relative Importance		Temporal Scope ⁴	Certainty ⁵
		Severity ²	Geographic Scope ³		
1-Bc Post-release mortality	15	3	5	2	2
1-3 Other entrainment					
1-3a (1-4) DWR owned diversions	12	4	3	2	1
1-3b (1-5) USBR owned diversion (Rock Slough)	16	4	4	2	2
1-3c (1-6) Private unscreened diversions	6	3	2	2	4
1-3d (1-6b) Mirant Pittsburg and Contra Costa power plants	16	4	4	2	2
1-7 North Bay Aqueduct	16	4	4	1	2
1-10 Propeller entrainment by cargo vessels	12	4	3	1	4
1-16 Monitoring mortality	12	4	3	1	3
3-9 Increased water depth (channel dredging; marinas, ship channels)	12	4	3	1	4
Low Importance Stressors (16-20)					
1-4 Flood bypass system					
1-4b Fish stranding	16	4	4	2	1
1-4c Passage barrier	16	4	4	2	1
4-6 Salinity control/compliance	16	4	4	2	4
Negligible Stressors					
1-12 Insufficient food supplies/location	0				
1-14 DCC operations	0				
1-15 Water temperature	0				
2-4 Reduced suitable adult habitat	0				
3-4 Reduced seasonal transport flows	0				
3-5 Reduced upstream attraction flows	0				

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		Severity ²	Geographic Scope ³		
3-11 Increases in temperature (global warming)	0				
3-13 Sea level rise	0				
3-14 Barriers to passage	0				

Notes:

¹**Importance Rating** – the product of the severity and geographic scope scores. Rating of: 1-5 is very high importance, 6-10 is high importance, 11-15 is moderate importance, 16-20 is low importance, and a score of 0 is of negligible importance.

²**Severity** – the relative magnitude of a stressor effect on the splittail population: 1 = severe effect – 4 = minor effect; 0 = no, negligible, or beneficial effect.

³**Geographic Scope** – the relative geographic area over which a stressor has effects on splittail: 1= entire geographic distribution of splittail within the Bay-Delta – 5 = none or minimal localized area of effect.

⁴**Temporal Scope**—addresses frequency that stressor operates on splittail: 1 = ongoing stressor, 2 = episodic or periodic stressor

⁵**Certainty** – the relative confidence in the assessment of stressor effects on the species: 1= high level of confidence – 5= little or no confidence in the stressor ranking, unless otherwise noted.